

MINTO CREEK PINE INFECTION, LINN COUNTY.
OREGON

On May 14, 1931 Messrs. Goodding, Mielke and Putnam studied in some detail an old infection center near Minto Creek on the Santiam River, Oregon discovered by L. N. Goodding in the fall of 1930.

The infected trees are growing on the edge of the talus slope occupying perhaps 10 acres. Surrounding this spot is a dense growth of over-mature Douglas fir and hemlock with an occasional mature white pine. Above the talus slope is a cliff perhaps 200 feet in height. Below the talus slope the ground slopes moderately to the Santiam River about a half mile distant. The elevation at the infection center is about 2,500 feet. The pines are comparatively slow growing even in the open although beyond 20 years of age the growth is very satisfactory. Small suppressed pines are occasionally found in the mature stand

Several large clumps of Ribes sanguineum occur in close association with the heavily infected pines at the edge of the talus slope. Some of these clumps are 12 feet high with a diameter of 10 feet. R. lacustris occurs occasionally in a mature stand. On Minto Creek approximately one-fourth of a mile south of the heavy infection center, R. bracteosum is moderately abundant. However, no infection was found on the pines growing close to R. bracteosum on Minto Creek.

In Table No. 1 there is shown an analysis of cankers made in the spring of 1931. In making this analysis no one tree was gone over completely. An effort was made to get a fair sample of the cankers on the area.

Table No. 1

Canker Analysis, Minto Creek Infection Center, Linn County, Oregon
May 14, 1931.

Individual Pine Infection							
Pine No.	Age	Height	Years Needles Borne	Crown Class	No. Cankers Trunk Limb		Remarks
1	45	35	5.5	D			500 cankers on tree.
2	40	12	6.2	S			Approx. 100 cankers.
							Canker on 1 st 13 wood is a L-T. Limb dead, trunk alive 18" canker on limb. 18" on trunk. Another dead canker on 1 st 14 growth.

Cankers on all but 1°13 and 1°14 growth occurred on middle third of pine No. 1.

Year of Growth Infected	Canker Analysis Number of Cankers							Produced Acacia Total		
	First Sympt.	Juve- nile	Pycnia Scars	Once	Twice	Several	Dead			
1927				2				2		
1926		1	6	12	3	.		22		
1925			2	10	6			18		
1924				4	4	1		9		
1923				1	4	1	2	8		
1922						1	4	5		
1921						9	11	20		
1920						3	18	21		
1919						9	12	21		
1918						7	5	12		
1914							1	1		
1913							1	1		
Totals				1	8	29	17	33	53	140

It is at once apparent from Table No. 1 that we have an old infection center at Minto Creek. It was believed that infection originated here in 1917 with heavy waves years in 1921, 1922 and 1927.

More conclusive evidence regarding the age of this infection center was desired. On May 25, 1932 Messrs. Goodding and Putnam again visited the area. Analysis of the cankers was made as completely as possible on two heavily infected trees. One of these trees was 10 feet in height, 30 years of age, suppressed, with 250 feet of needle stem and bearing its needles 5 years. 88 cankers were found on this tree. The other pine was 50 feet high, 45 years old, dominant, with 4,000 feet of needle stem and bearing its needles 5 years. 250 cankers were found on this tree. No cankers were seen on the 1st or 1st whorl or above. All the

cankers were on the lower half of the tree. In Table No. 2 there is shown the analysis of cankers on these two trees.

Table No. 2

Canker Analysis of Cankers Found on Two Trees, Minto Creek Infection Area, Linn County, Oregon, May 25, 1932

Individual Pine Infection								
Pine No.	Age	Height	Feet Needle Stem	Crown Class	No. Cankers	Years Needles Born	Remarks	
1	30	10'	250	S	88	5		
2	45	50'	4,000	D	250	5	No cankers seen on 191° whorl or above. All cankers on lower half of tree. Doubtless many cankers on twigs fallen off.	
Canker Analysis								
Year of Growth Infected	Number of Cankers			Proportion Aecia				
	First Sympt.	Juve- nile	Pycnia Scars	Once	Twice	Sev- eral	Not Now	Dead
1927			2	1	11			14
1926			5		16	1	3	25
1925			4		22	8	5	41
1924					6	10	4	19
1923						13	4	2
1922						1	10	5
1921							12	4
1920							12	16
1919							14	3
1918							16	3
1917							10	2
1916							4	5
Not Known								19
Total			11	1	55	110	53	108
								338

In addition to the cankers shown in Table No. 2 there were also found three cankers of older origin on three trees in the vicinity. These cankers were as follows: 1 canker fruiting several times, 1913 wood; 1 dead canker

1914 wood; 1 canker fruiting several times, 1915 wood.

The canker pattern in Table No. 2 is not clear. It is obvious that there is an old infection center here but to pick out the wave years is not possible from the canker analysis. In analyzing these old cankers there is a high probability of error in the determination of the year of growth at the center of the canker. It is highly probable that some of these cankers listed as appearing on wood of 1916 to 1920 growth might have come on adventitious shoots at a younger age which were not apparent at the time of examination. However it is not reasonable to think that all of the cankers entered in that way. It is conceivable that infection originated in 1917 with wave years in 1921 and 1922, with other years of heavy infection in 1926 and 1927. It is probable the infection occurred every year after 1920. Owing to the fact that the trees bear their needles five years, infection of any one year could be distributed over four or five years' growth. This probability, coupled with the probability the infection took place each year after 1920, makes the data very difficult to analyze. The peculiarity of this infection center is the dearth of cankers of 1927 or younger origin. No explanation is offered for this unusual circumstance. *R. sanguineum* are abundant and in close association with the pines. The aerial volume each year is enormous. Perhaps due to their heavy infection, *R. sanguineum* leaves fell to the ground early before much telial development took place. Possibly very few telia were produced on the *R. sanguineum* here. The explanation for this dearth of 1927 origin cankers most likely was chiefly influenced by the Ribes factor. *R. sanguineum* infection was found on May 14, 1931 at this point.

At that time the Ribes infection appeared as small yellow spots with few suggestions of uredinial mounds. On May 25, 1932 the *R. sanguineum* bushes were quite carefully gone over. No yellow spots or incipient Ribes infection were seen but two leaves were found infected, each leaf having a cluster of 6 or 8 uredinia sori in which uredinia were being produced and disseminated.

Scouting in the general vicinity of this infection center showed that infection did not spread very rapidly. An occasional canker, probably of 1927 origin, was found. On the Santiam River, about one and a half miles from the infection center, one small suppressed white pine was found having 30 feet of needle stem and bearing its needles 5 years. On this tree 6 cankers were located very probably of 1927 origin. This tree was within a few feet of a *R. sanguineum* bush. One juvenile canker was found this spring on a pine at Pamelia Creek about 4 miles north of the Minto Creek infection center. A canker of similar stage was found on Pamelia Creek in the spring of 1931. A very few cankers were found in the fall of 1930 south of the Minto Creek infection area along the trail for a distance of one and a half miles. The salient facts regarding the Minto Creek infection area are as follows: In an opening formed by a rock slide within an over-mature dense stand of Douglas fir and hemlock, there is a small infection center in which the pines are heavily infected.

Analyses of cankers made in the springs of 1931 and 1932 indicate the infection possibly originated here in 1917 with infection each year from 1920

to 1927. Possibly more than the average amount of infection occurred in 1921, 1922 and 1927.

One of the outstanding peculiarities of this infection is the dearth of 1927 origin cankers, the situation in which *R. sanguineum* bushes are abundant and closely associated and in which the volume of acacia is very large each year.

In considering the length of time infection has probably been established, there has been very slight spread of infection from the old center.

Spokane, Wn.

6/3/32

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